Case History

Trendmaster® 2000 System helps improve

by Alejandro Fuentes Candelero,
Engineer
Plant Superintendent
Azcapotzalco Fuel Supply Center

and Daniel Guzman Valdivieso,
Engineer
Mechanical Maintenance Chief
Azcapotzalco Fuel Supply Center

The Azcapotzalco Fuel Supply Center, located in Mexico City, began operation in 1933 as the "18 of March" fuel refinery. By 1959, it had a daily capacity of 25,000 barrels a day, but, because of environmental concerns, later ceased operating as a refinery and was transformed into a fuel distribution center.

Azcapotzalco is a key hub in a critical distribution network. Each day, it receives and distributes over 200,000 barrels of petroleum distillates through several pipelines. The Mexico City Airport and the nearby Anil, Barranca and Terminal Satellite Norte distribution centers are dependent upon it (Figure 1). It is now of strategic importance to Mexico City and the nearby cities of Cuernavaca and Toluca.

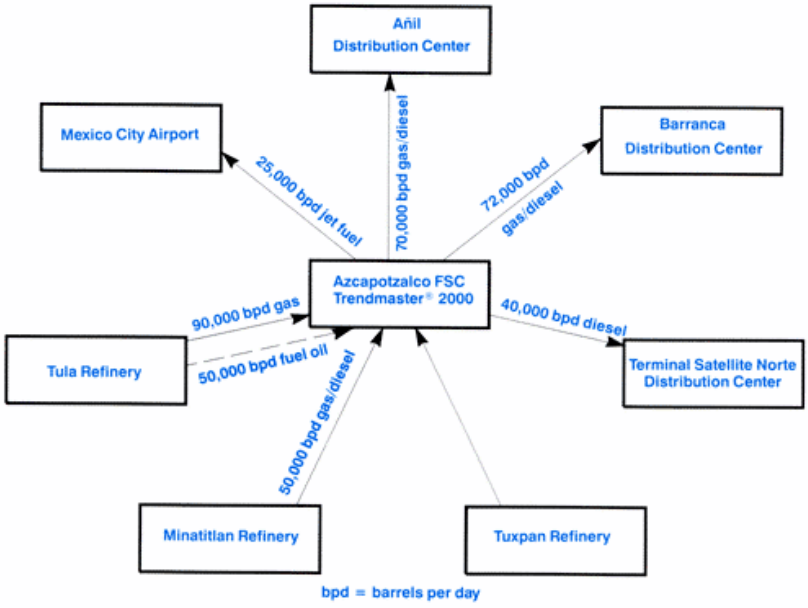

Figure 1
Fuel Distribution Network

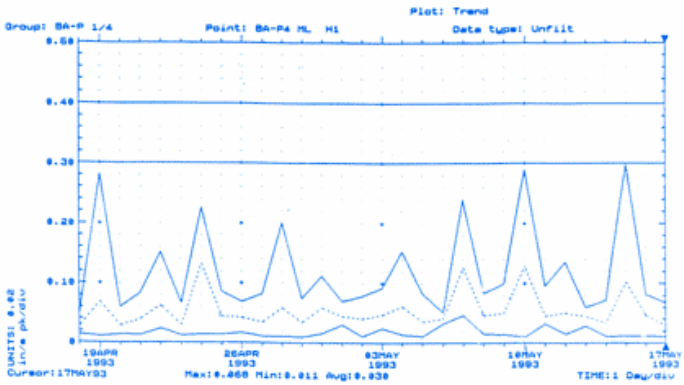

Figure 2
Trend plot of pump

Because of its importance for the fuel supplies of the Mexico City Valley and surrounding cities, the pumping equip-

reliability at a Mexican fuel distribution center

ment at Azcapotzalco is critically important, and its reliability is the plant operator's highest concern. In early 1993, the plant operators began to investigate how they might upgrade their machinery maintenance program.

The preventative and predictive maintenance program already in place was based on weekly vibration level measurements taken by hand with portable equipment. However, this program was labor-intensive, and sometimes the information it provided didn't arrive in time for the decision makers who depended on it. Weekly readings were not throught adequate to ensure machine availability, but more frequent measurements would have required very expensive additional manpower. However, additional manpower could not ensure that machine information reached the plant's decision makers in a timely fashion.

Knowing their requirements, the plant operators analyzed their options and decided that an online, periodic monitoring system was the most cost-effective solution to their problems.

Plant personnel decided to install a Bently Nevada Trendmaster® 2000 System. Trendmaster® 2000 is a computer-based, online system that automatically samples, processes and trends data for every point in the system.

They initially installed 40 transducers on the plant's most critical pumping equipment. Trendmaster® 2000's innovative design for data transmission enabled them to install all 40 transducers along a single 4-wire cable connected to the system computer. This greatly reduced installation time and costs. The entire system was installed as time permitted and was complete and online within two weeks.

Trendmaster® 2000 Benefits

In just the first 60 days, the Trendmaster 2000 System provided plant operators with important machinery information that enabled them to make informed decisions that couldn't be made before.

For instance, the trend plot of a pump (Figure 2) showed the effect that different operating conditions have on vibration levels, and indicated that operating procedures needed to be reviewed. The trend plot of a second machine (Figure 3) showed that the machine had large excursions into the vibration alarm region during exceptional operating conditions. This indicated to the operators that the second machine needed mechanical reconditioning to allow it to withstand these exceptional conditions.

In another instance, the Trendmaster 2000's ability to "freeze" vibration data when a vibration alarm occurs yielded data that revealed the presence of a subsynchronous vibration component in a pump. Azcapotzalco's operators analyzed a spectrum plot (Figure 4) and identified this as a fluid-induced instability on the pump impeller caused by certain operating conditions. In all cases, the Trendmaster® 2000 System provided information to the Operation and Maintenance Departments in a timely and easy-to-understand format.

Conclusion

The Azcapotzalco Operation and Maintenance Departments use the Trendmaster 2000 System to identify potential problems before they occur, striving towards their goal of a more reliable and trouble-free operation with reduced maintenance costs. With the Trendmaster 2000's modular design, expansion is easy. The benefits seen so far have led Azcapotzalco to consider expanding the system to adjacent semi-critical equipment. ■

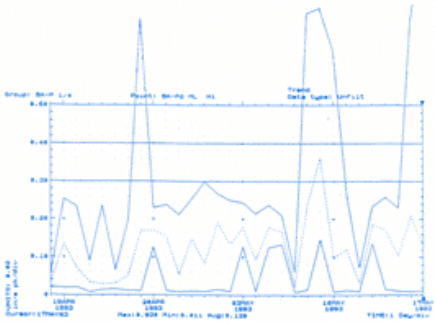

Figure 3

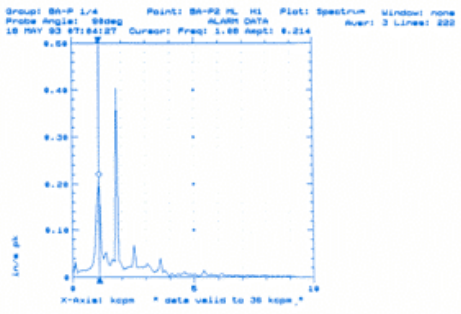

Figure 4
Spectrum plot showing fluid-induced instability